MAINTAINING SOIL FERTILITY IN 1933.

A radio talk by Dr. A. G. McCall, Bureau of Chemistry and Soils, delivered in the Department of Agriculture period of the National Farm and Home Hour, Friday, March 10, 1933, and broadcast by a network of 49 associate NBC radio stations.

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When our friend Salisbury, asked me if I would give you people of the Farm and Home Hour radio audience some comments today on the individual's problem of maintaining soil fertility under present difficult conditions, I agreed with some reservations. This is the way I felt and still feel about it: I can discuss with you the general principles of keeping up soil fertility and give some examples of how men are applying these principles to their own farming operations. But obviously, I cannot present to you people working with soils of dozens of different types, spread over half of the area of the United States, a sure-fire formula that would work for each of you. So I ask you in listening to me today as I give you a brief summary of the principles of keeping up soil fertility as worked out by scientific investigations and the experience of farmers -- I ask you to understand clearly that I am simply throwing out some suggestions for you to think over and act upon if you find that they apply.

The soil scientists of the nation, let me assure you, are keenly aware of the fact that a man's business situation plays as large a part as scientific principles in determining how he is going to do the practical job of keeping up the fertility of his soil. Every man realizes that by maintaining this at a high point, he protects his equity in his property. He knows that a fertile soil is more likely to repay him for his labor and investment than a run-down soil. But under present farm business conditions, a good many men are shut out from the possibility of using methods of maintaining fertility that involve large cash expenses.

So in discussing this matter with you, we are going to keep that fact in the foreground all the time.

Now, then, thinking along those lines, let's consider briefly 5 general principles of maintaining soil fertility which you may find applicable on your places this year. Here are the 5 principles:

No. 1, in this period of over-supply of a good many farm products, consider carefully the wisdom of taking the less fertile acres out of staple crop production and putting them into such crops as trees or pasture.

No. 2, make the best possible use of manure and compost materials.

No. 3, where possible, correct undue soil acidity by the proper use of liming materials.

No. 4, make the maximum possible use of green manuring crops to keep up the highly important organic matter content of the soils, to prevent soil washing, and, where you use legumes, to increase the available nitrogen.

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No. 5, if your soil needs chemical fertilizer to produce economically, follow the best program that you can finance.

Now I should like to give a considerable part of this talk to discussing that first point; the possibility of putting acres not well fitted for staple crops into perennial crops such as trees or permanent pasture. Again let me say that I realize the practical difficulties many farmers have to overcome in putting this principle into practice. So long as individuals in order to keep title to their properties must pay onerous interest charges and tax payments with the income from crops selling at the lowest prices in two generations, many men will be forced to plunge ahead with a program of producing on every plowable acre of their farms in order to raise the necessary cash.

But, I believe the man not under such bitter necessity will now profit more than ever before by making sure that every one of his acres produces economically. This principle of acre performance is like the principle of dairy cow performance which dictates that if a cow's yield of milk or butterfat falls below a minimum point she be culled out of the herd. Under normal conditions, the so-called "boarder cows" are not tolerated in dairy herds. Nor should low yielding, unprofitable acres be tolerated if a man can retire them from production without jeopardizing his equity in his property.

Let me give you an example: A potato grower devoting 50 acres to his crop has several acres which produce scabby, unsaleable tubers. He finds that he would be put to considerable expense to apply sulphur or otherwise get the soil in condition to grow scab-free potatoes. The financial outlay and energy required to produce an acre of potatoes would be the same for scabby or clean tubers. So the grower decides to utilize this undesirable potato land for other crops. Thus he reduces the cost of producing each bushel of potatoes. I have no doubt that altogether many thousands of acres of land not fit for production of good quality potatoes could be retired from this crop to the benefit of both growers and consumers. Certainly, withdrawing such acreage from competition with good potato soil would be a boon to potato growers generally.

This specific example I believe will help us to realize that we can raise our standard of soil productivity by taking out of crop production unprofitable acres. As a general principle, certainly this policy of soil selection is preferable to a policy that involves planting unadapted land to crops. Farming infertile soil involves the same overhead expenses as farming more fertile acreage. If we attempt to share the fertility requirements of the poorer soil with the better grade soil, and fail to find out if the poorer soil would not grow less exacting crops economically, we are going to waste soil fertility. A sounder general policy would be to utilize fewer acres at full maintenance of soil fertility, rather than farming the total acreage on a reduced scale and thus increasing the cost of producing each bushel or pound.

Now when it comes to selecting land that is to be taken out of staple crop production, many experienced farmers will need no information from the scientists. They have the poor soils on their farms spotted. I recall vividly one day 16 years ago when a group of us were laying out some soil experimental fields in Southern Maryland. A farmer passing by stopped to talk with us. He outlined an irregular area in one of the plots for us and said, "That's one of the most trifling pieces of soil around here. It's just trifling." And we found out he was certainly right.

Of course, every man has available much specific information on the soils of his farm through his county agricultural agent and the soil scientists at his State agricultural experiment stations.

Well, I see that I have little time to talk about the other four general principles pertaining to soil fertility under present conditions. As to manuring, let me simply repeat the old, old axiom of good farming, that it pays to protect available supplies of manure carefully so as to avoid losses of the valuable plant food materials; to apply the manure to the field as soon as possible, and to distribute it uniformly.

As to correction of acid soil conditions, there is available a wealth of specific information from county agricultural agents and experiment stations.

Now that fourth point -- good green manuring practice. Inability of farmers to finance the usual chemical fertilizer programs, and increasing realization of necessity for keeping cover on the soil to stop erosion has created widespread interest in it. Of course, a good green manuring program is fundamental at any time to the maintenance of the organic matter content of the soil. At present in many different sections of the country different soil-fertility green manuring programs are underway, with thousands of farmers getting the necessary information from their county agricultural agents. Some examples are the lime and legume programs for Eastern Kansas and Missouri, the cover crop activities which have increased so tremendously in the last two years in the Southeastern States, and so on.

Finally, just this word about the chemical fertilizer programs. Like animals, plants must be fed. Underfed plants pay a poor return. The soil naturally provides some plant food, but in many sections the supply in the soil is not large enough to give complete nourishment to the staple crops. The deficiency of plant food, unless remedied by fertilizer applications, may not only cut yields through starvation, but through diseases brought about by undernourishment of the plants. For these crops in these sections, economical production depends upon fertilization. It is to be hoped that all growers who are producing under such conditions will be able to finance the correct fertilizer program.

Now in closing, let me remind you that the scientific information on keeping up soil fertility that has come from half a century of research by the Department of Agriculture and the State experiment stations is at your service through your county agricultural agent and your State agricultural college.